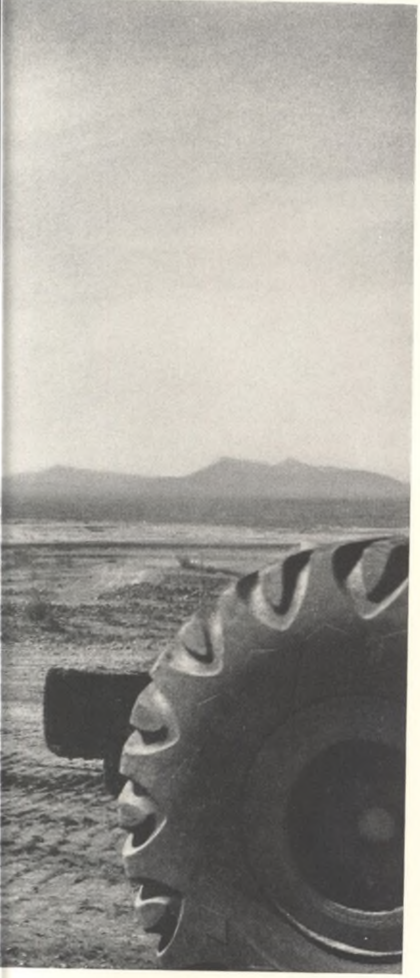
THE TEXACO STAR

FALL 1959

BUILDING A DAM IN THE DESERT

A formation of earth-laden trucks charges up the long, gentle slope from the desert floor to the crest of Painted Rock Dam — keeping intact a pattern of continuous motion which is speeding the earthen flood control wall to completion. Flood Control at Painted Rock, *beginning on Page 4, describes the big dam-building job and tells of the part Texaco is playing in it.*



THE TEXACO STAR

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THE TEXACO STAR

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THE COVER PHOTO: At sundown, the massive forms of earth-moving equipment—being used to build Painted Rock Dam on the Gila River in southern Arizona—are silhouetted as they trail across the top of the dam. When darkness comes, huge batteries of floodlights will be turned on to light the construction area so work may be continued without stop through the night. The photograph was taken by Simpson Kalisher as part of his coverage for *Flood Control at Painted Rock*, beginning on Page 4 of this issue.

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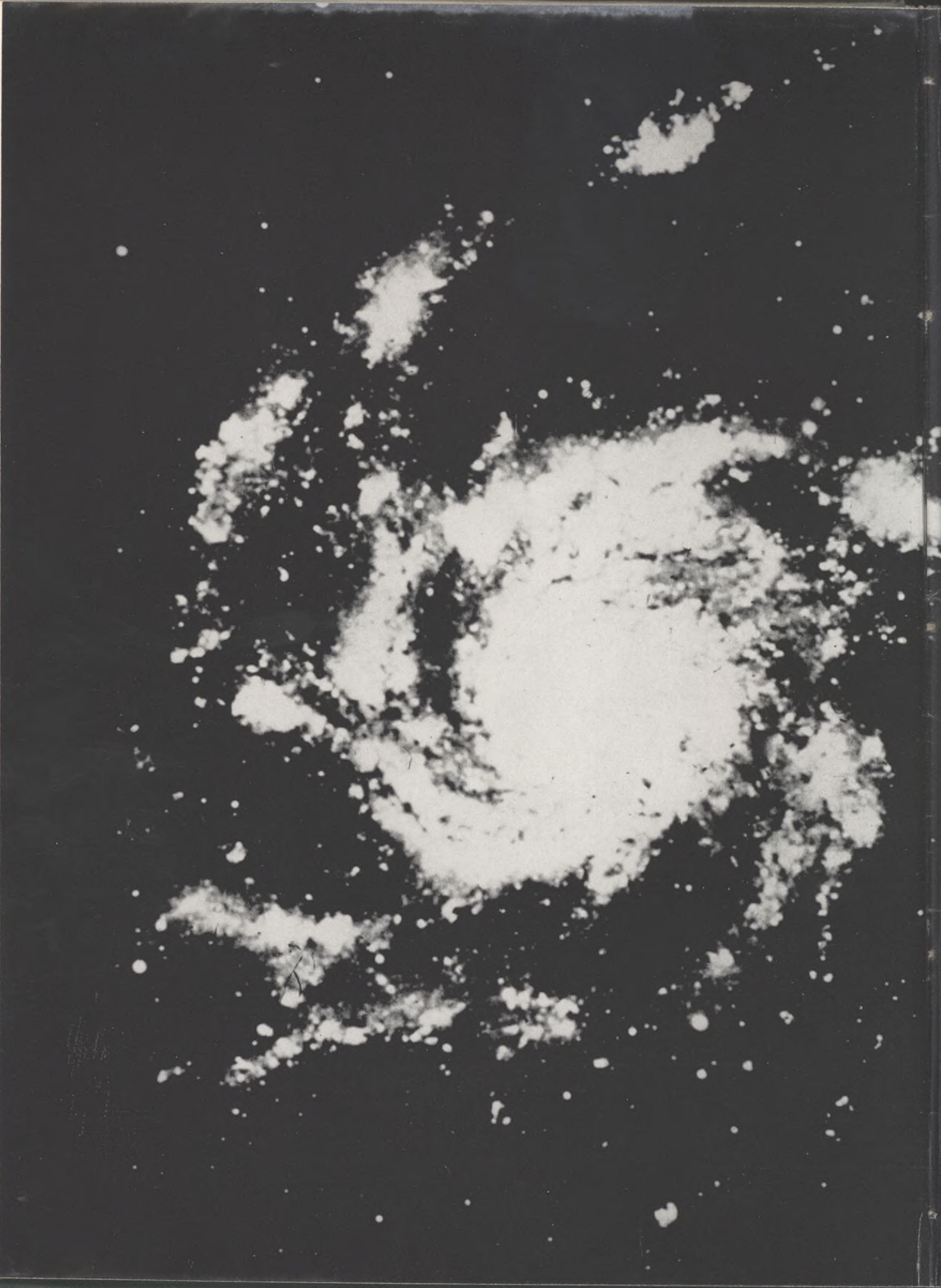


A PLACE IN SPACE

The day man hit on the idea of the wheel, he began expanding his view of the world around him. With the airplane he has been able to broaden the view tremendously. Now he looks to the day when he will leave his world and rocket into space beyond atmosphere, to see what is there.

What he will find is a matter already answered, partly, by the observations he has made from the earth and by data radioed back from the satellites he has recently put in orbit. When he will make his first flight remains a matter of conjecture. Soon, though; very possibly within the next few years.

In a research center outside Richmond, Virginia, one of Texaco's subsidiaries is helping man get ready for his takeoff. Its name: Experiment Incorporated.

Texaco acquired Experiment Incorporated as a wholly owned subsidiary last June, as a first move toward a place in space. With the acquisition it gained a new, valuable research arm in the increasingly important fields of high-energy missile and aircraft fuels, advanced propulsion systems, and related chemical development fields. Experiment, one of the country's leading high-energy fuels research organizations, has been working on the problems of space flight for nearly 15 years.

Since 1945, it has been developing fuels and engines aimed at making the most effective use of the energy released by combustion, to power missiles. In that first year of its existence (the first year, for all practical purposes, that rocketry became a peacetime reality) the organization made major contributions to the design of the combustor which went into the first successful supersonic ramjet. (The combustor is the element in which fuel and an oxidizer are mixed and ignited to produce the gas which gives a jet propulsion device its thrust.) Since then it has been busy on a variety of projects, with an impressive history of success.

Much of the study carried out in the Richmond laboratories and testing grounds is classified as confidential, for obvious reasons. From what can be told about its current projects, here is a sampling:

- Work on hybrid (one liquid component and one solid component) rocket fuels which could hold advantages over either straight liquids (kerosine-type fuels, for example) or straight solids (ammonium nitrate often is used).
- Development of a new type of air-breathing missile engine with potential thrust capability over a wide range of speeds. Of the two types of engines now considered available, one, the turbojet, is effective at speeds up to Mach 3 (three times the speed of sound) but above about Mach 3 its performance becomes inferior to that of the ramjet, which is the other available engine type. The performance of a ramjet is poor at lower speeds and it becomes virtually useless at speeds below Mach 1.5. Experiment Incorporated is attempting to devise a new kind of power plant for missiles which would combine certain characteristics of the ramjet with some of the turbojet's to arrive at top efficiency over the full range of a missile's flight in the atmosphere.

This country's research and development expenditures on supersonic vehicles reached something over $2 billion last year, a figure which is bound to grow as the search continues for fuels with more thrust and better controllability; engines with less weight, using less costly structural metals; more efficient tracking and telemetering techniques. Surrounding these basic problems of rocketry is a vast set of peripheral ones; and these, too, are bound to come in for more and more attention. One day, missiles and space vehicles will leave the exclusive domain of the Government and become a major commercial enterprise. Texaco plans to have a firm footing in the missile and space vehicle field when that day arrives: its acquisition of Experiment Incorporated, now, should give the Company an invaluable advantage later.

Most of Experiment's work so far has been done under Defense Department contracts, particularly for the Navy Bureau of Ordnance. This work is expected to continue and expand. In fact, Texaco's close association with aircraft and propulsion systems manufacturers will provide Experiment with the opportunity to engage in the extensive development and production necessary to carry many of its projects beyond the early research stages.

It took imagination to think of the wheel, without question. Imagination and considerable technical skill went into the first airplane. Enormous technical knowledge, educated curiosity, and imagination continue to pour into missile and space vehicle research—and Experiment Incorporated is providing all three. •

FLOOD CONTROL AT PAINTED ROCK

The big trucks roaring across the desert floor, up onto the sloping crown of earth, and down again for another load of the soil they are piling and tamping into place, never seem to stop. As they grind past under the Arizona sun, an endless caravan moving at top speed in a dusty column, they almost look as though they may turn into butter like the tiger in the children's fable.

Yet at dusk (left) they are still rolling, still hauling and piling—forming the solid earthen wall that is to be Painted Rock Dam on Arizona's Gila River, designed to prevent a possible flooding of the immensely valuable farmland that lies to the south of Painted Rock in one of the state's richest agricultural areas. Through the night they roll, their massive cabs and dump bodies picked out by batteries of floodlights that tower over the dam crown and, from a distance, give one the fleeting, unreasonable notion that a night baseball game must be going on in the middle of the desert.

The tremendous earth-moving job the Painted Rock project represents is about as close to non-stop construction work as one is likely to see. It is also a terrifically demanding test of the diesel fuels, gasolines, and lubricants that keep the big machinery going. As exclusive supplier of those products to the contracting firm which is building the dam, Texaco has the responsibility of seeing that what it supplies stands up under the most trying conditions.

A four-hour halt in the early morning gives tires and engines a rest; but by the time the sun has started climbing up behind the hills bristling with cactus forests that line the valley in which the dam is being built, they are moving again. Around and around they rumble, in a huge, hot circle.

The heat is incredible. By late Spring, daytime temperatures often hit 100. In the Summer, 130 becomes common. Last Summer a curious engineer stuck a thermometer into one of the roadways the trucks use, and got a reading of 160. Yellow dust, visible for miles, hangs over the construction area like a roof, supported on invisible pillars of hot air.

All of it is not so conveniently lifted, however; the constant shuttling of the trucks churns up clouds that cling to the roads and sift into the engines. One of the contractor's trucks does nothing but go over and over the roads, sprinkling them to keep the dust down and cool them off so tire wear will not be any worse than it is.

In spite of the heat and the dust, a driver will put about 25,000 miles on one of the trucks in two months — and the 36 pieces of earth-moving equipment being used will haul two million yards of desert land up onto the dam. The visitor quickly learns to stay out of the way as he drives along the roads they use. If a truck is behind him, he gives it a wide berth. A strictly enforced system of one-way traffic for the trucks with criss-crossing roads for supervisory autos and other, rare, vehicles helps prevent road accidents.

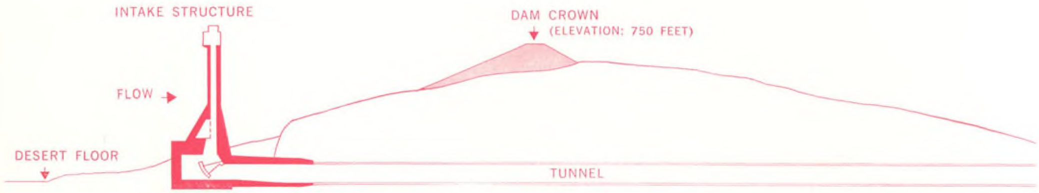
Behind the race to complete the Painted Rock dam is the paradox that it is being built to control floods on a stream carrying so little water, normally, that irrigation supplies must be pumped *upstream* to farms in the river basin. Dams and diversion works upstream of Painted Rock, constructed over the last 20 years or so, have greatly cut down the flow in the lower basin of the Gila; only in years of extreme rains does flood water reach the area. But if such a flood should occur now, it could mean disaster for the farms downstream that have been greatly built up in recent years through irrigation. Forty years ago — even 20 years ago — a flood would have caused a limited amount of damage. Today a serious flood would mean a loss of millions of dollars in carefully cultivated land on which cotton, citrus fruit, and other important crops are being grown (southern Arizona is one of the nation's leading areas in the production of oranges, lemons, and grapefruit — and is about the only place outside of Egypt where the particularly luxurious type of cotton known as Pima can be grown successfully). The reservoir area behind the dam will be capable of containing 2.5 million acre-feet of water, and will extend back from the dam for a distance of some 14 miles.

The reason for the day-and-night rush is based on the economics involved in a contract construction job of this sort: a bonus is paid for early completion, a penalty exacted for delay. And, of course, the sooner Mittry Construction Company completes its work, which began in the Autumn of 1958, the sooner it can move its equipment on to another assignment. So the work goes on at top speed; and over a part of the river bed which has been bone dry for years, a huge earthen dam takes shape. By the time it is completed, late this year, Mittry engineers estimate, more than 9.5 million cubic yards of earth will have been moved.

The principle of the building job is very simple. About a mile downstream of the dam site, and two-and-a-half miles upstream of it, big shovels and draglines claw chunks of dry, loose earth from the desert and dump them into the trucks that pull up for another mammoth load in an endless procession — another waiting truck every few minutes. The loaded trucks haul the earth to the dam site, dump it at the direction of men who wave them into the right spots with flags — much like an aircraft carrier's flight deck officer waving fighters in for a landing, and just about as urgently.

By driving over the crest of the dam, the trucks pack down the earth they have piled up. When the earth wall has been built up to specifications, it is faced on both sides with loose rock. An intake system and a control tower have been erected, meantime, and that is that.

That, at least, is the principle, vastly simplified. In practice the job is a grueling battle against delay and the almost unnatural rigors of the desert. Keeping a fleet of trucks going at



high speed, almost without stop, for months at a time calls for expert care. An important part of this care is supplied by a Texaco lubrication engineer, who regularly drives down from Phoenix to consult on the use of the lubricating oils and greases Mittry is purchasing (about a carload a month is delivered to the job site), and to suggest solutions to any lubrication problems the contractor may be having. His advice is asked on problems concerning any of the shovels, tractors, scrapers, rollers, and graders the contractor uses to rush the dam to completion.

The Mittry organization maintains a completely equipped machine shop and garage at the dam site, where worn out tractor treads can be repaired or replaced without delay; tires changed; whole new engines installed if necessary. It keeps an inventory of tires (mammoth tires, the size of a transport plane's) and parts on hand that would do justice to a good-sized trucking company—which, in a way, it is.

Along with the vast acreages of farmland the Painted Rock dam is being built to protect, two small plots within the reservoir area also are being looked after. These are two very early cemeteries — one holding seven graves of white settlers believed to have been massacred by Indians; the other a Papago tribal cemetery still in use. The first will be protected by building eight-inch-thick slabs of concrete over each grave. The Indian land will be surrounded by a 15-foot-high dike.

The practical concern with getting Painted Rock Dam completed as quickly and efficiently as possible has not by any means been forgotten; and the big trucks continue to roll through the blistering desert at turnpike speeds. But this deferential note in the blueprints, preserving the ancient burial grounds, adds an intriguing twist more poignant than practical to the construction job. •

In the truck maintenance building which was built on the work site, a Texaco lubrication engineer, above, counsels on a lubricating problem. Two men standing in the dam's tunnel, right, give an idea of its size. Tunnel's interior is one of the few cool spots in the area.

A QUIET, PERSISTENT REVOLUTION

by Gardner Soule

The following article discusses a Texaco development which is far more than a major commercial success. It is an accomplishment of world-wide significance which could mean relief from hunger and the chance for expanded industrialization for many nations. On December 1, more than 1,000 members of the chemical engineering profession and of industrial management will meet in New York City to witness the McGraw-Hill Publishing Company's presentation to Texaco of the 1959 Award for Chemical Engineering Achievement—which will recognize the Texaco Synthesis Gas Generation Process as "the outstanding group accomplishment in chemical engineering since 1956." This article describes that accomplishment.

The nation fortunate enough to list hydrogen among one of its readily available gases is fortunate, indeed. From hydrogen, product after product can be made. Ammonia, chemicals, rocket fuel, explosives, the nitrogen fertilizers that make greatly increased food production possible are a few. Plastics, synthetic gasoline, manufactured gas are others—and the list is virtually endless.

Hydrogen, however, is rarely found in a free state on earth. Until recently, it has been reasonably abundant only in those countries lucky enough to have large supplies of one of three raw materials: coal, water, or natural gas.

Now, thanks to a truly revolutionary development, which has been named the Texaco Synthesis Gas Generation Process, almost any nation in the free world can inexpensively produce all the hydrogen it needs. The new process allows the use of *any* hydrocarbon as the starting point for the production of synthesis gas rich in hydrogen. Propane, butane, crude oil, fuel oil, natural gas, light distillates—any of these can be used. The beauty of the Texaco development is that at least one is almost bound to be available almost anywhere—and if none is, crude or fuel oil can economically be shipped to the nation that wants to get started, producing its own hydrogen.

Recognition is coming fast for the new process. Already,

Urea fertilizer, one end product of Texaco's Synthesis Gas Generation Process, is hand-sown by a Korean farmer.

the Texaco Development Corporation has licensed 37 companies in 15 nations to use the process.

The Texaco method makes it possible to take the least expensive, or most plentiful, hydrocarbon, and turn it into very valuable and until now very scarce hydrogen. This means any company or refinery almost anywhere in the free world can obtain a license to operate the process and enter the chemical industry or the nitrogen fertilizer business. And this, in turn, means a big new market for oil.

Opening this market around the world, the Texaco process, already in operation in North and South America, Europe, Asia, and on a number of islands in between the continents, is being used for many purposes. It is producing hydrogen for use in the manufacture of plastics in this country and Japan, wood alcohol here and in Brazil, manufactured gas for heating and cooking in England and Portugal, fuel for American space vehicles, and synthetic gasoline. The synthesis gas also furnishes the source of hydrogen used for hydrogenating oil and reducing iron ore.

The Texaco process has been called "a tool for which there are endless uses." By far the greatest single use so far is in the production of nitrogen fertilizers.

This is of far-reaching significance to all mankind. The Texaco Synthesis Gas Generation Process is, for agriculture, a development of huge importance. It actually offers a chance to eliminate the hunger that chronically plagues three-fourths of humanity.

Crop surpluses like those of the United States are rare. Farmers never have been able to grow nearly enough food for the world's hungry. Of all the aids agricultural scientists have provided farmers, perhaps the most important are nitrogen fertilizers. Last year they became the principal fertilizers, based on tonnage, in all the world's agriculture.

Hydrogen is the key to the manufacture of nitrogen fer-

SYNTHESIS GAS RAW MATERIALS:

NATURAL GAS
United States/Italy
Yugoslavia/Sicily

DIESEL FUEL
United States

HEAVY FUEL OIL
United States/Brazil/England
Yugoslavia/Belgium/Sicily
Canary Islands/Japan/Formosa
Canada/Korea/France

CRUDE OIL
United States/Puerto Rico/Japan

REFINERY GAS
Brazil/Formosa
Japan/Portugal

BY-PRODUCT GAS
France

LIGHT DISTILLATE
Portugal

SYNTHESIS GAS END PRODUCTS:

Acryglass	Aqua ammonia	Fatty amides	Nitric acid
Acrylamide	Bisamide	Fatty amines	Nitrocellulose
Acrylonitrile	Blasting caps	Formamide	Nitroglycerine
Ammonia	Calcium cyanide	High purity hydrogen	Nitrophosphate
Ammonium bicarbonate	Caprolactam	Hydrogen cyanide	Nylon intermediates
Ammonium chloride	Celluloid	Iron ore reduction	OXO products
Ammonium inidodisulfamate	Compound fertilizers	Lucite plastic	Refined stearic acid
Ammonium nitrate	Cuprammonium rayon	Methanol	Smokeless powder
Ammonium sulfate	Cyanuric chloride	Methyl acrylate	Soda fertilizer
Ammonium sulfamate	Cyclohexanol	Methyl amine	Manufactured gas
Ammonium sulfite	Dynamite	Methyl methacrylate	Urea
Anhydrous ammonia	Ethylene glycol	Methylol amide	

tilizers. The hydrogen is combined with nitrogen (taken out of the air) to make ammonia. Then the ammonia goes into a number of kinds of nitrogen fertilizers.

Nitrogen fertilizers can be used either on land that has been overfarmed for centuries or on very productive acres. They are valuable, that is, almost everywhere. Perhaps the best way to demonstrate their importance is to list some of the crops that benefit from them: corn, wheat, oats, timothy (grown for hay), potatoes, tomatoes, cabbage, apples, peaches, oranges, cotton, tobacco. And rice—the staple food of Southeast Asia.

Today, food is being grown with nitrogen fertilizers from the Texaco process in the United States, Canada, Puerto Rico, Brazil, Italy, England, France, Belgium, and Japan.

Soon, plants using the process in the production of fertilizers will be started in Portugal, Sicily, the Canary Islands, Formosa, and Korea.

Of all the nitrogen fertilizers, one of the most sought-after is urea. That's because it feeds its nitrogen into the soil slowly, and one application is enough for a growing season.

The Texaco process is already being used, or soon will be, in the production of urea by the Cooperative Farm Chemicals Association, Lawrence, Kansas; Deere & Co., Pryor, Oklahoma; W. R. Grace & Co., Woodstock, Tennessee; the Société Carbochimique, Tertre, Belgium; the Republic of Korea, Chung Ju, Korea; Showa Denko K.K., Kawasaki, Japan; and others.

In Selma, Missouri, the Mississippi River Chemical Co.

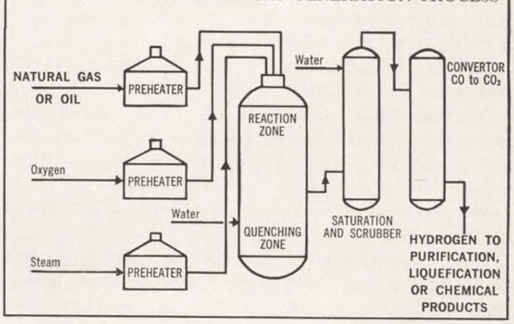
built a plant that makes ammonia from either natural gas or diesel oil (which it always has on hand to power its compressors). In the Winter, when the demand for gas is high, the company uses the diesel oil as a raw material.

Of 20 ammonia plants recently built in this country, 10 installed the Texaco process—a remarkable show of acceptance for a new method.

The biggest importance of the Texaco process appears to lie ahead. It is expected to be a key factor in a quiet, persistent, chemical engineering revolution that is well under way in the world. Inexpensive synthesis gas may well contribute sweeping changes in many fields: chemicals, metals, high-energy fuels, and other important industries.

Hydrogen is one of the most promising fuels yet uncov-

THE TEXACO SYNTHESIS GAS GENERATION PROCESS



ered for powering space craft. It may some day take travelers from New York City to London in minutes. It has the power potential.

Already, the Air Force has a plant inland from Palm Beach, Florida, to produce, for rocket fuel, liquid hydrogen in far greater quantity than any plant has ever turned out before. The plant uses the Texaco process.

Besides going into fertilizers, ammonia is a basic material in industrial refrigeration, explosives (for military use and for mining, highway construction, and other work), photography, dyes, celluloid, drugs, and insecticides.

One American manufacturer uses hydrogen produced by the Texaco method to make many chemical intermediates for such products as Nylon, acids, alcohols, and plastics.

In Britain, where coal is plentiful, Imperial Chemical Industries is beginning to use the Texaco process to obtain ammonia starting with fuel oil. It's cheaper, and it conserves good coking coal for the steel industry.

Two Japanese companies report they start with crude oil and end with ammonia derivatives, drugs, plastics, acids. At Deere Park, Texas, the Rohm & Haas Company starts with natural gas and produces methanol and related products.

Synthesis gas can be used as a reducing agent—to provide the necessary gases to separate iron and other metals from their ores. The Alan Wood Steel Company in Pennsylvania is already using the Texaco process, combined with Hydrocarbon Research's H-Iron Process, in iron-ore reduction. The Bethlehem Steel Company soon will be.

In localities where natural gas is not available, the Texaco process can provide fuel for heating and cooking. In Partington, England, the North Western Gas Board is preparing to use heavy fuel oil and the Texaco process to produce manufactured gas.

In Lisbon, Portugal, the Sociedade Portuguesa de Petroquímica is constructing a plant to use a light distillate, at present the cheapest hydrocarbon fuel there, for the very same thing. The Lisbon company also will produce ammonia and ammonium sulfate, one of the nitrogen fertilizers.

Texaco first became interested in synthesis gas several years ago, because of the Company's concern with providing long-term fuel supplies for the United States. Though there is no prospect of an oil shortage at present, if this country ever were isolated by war from its foreign oil supplies it might be necessary to obtain gasoline and other fuels from hydrocarbon synthesis, shale oil, tar sands, coal, and hydrogenation of heavy residual oils.

To obtain gasoline from any of these, hydrogen is needed. Up to now, hydrogen has been too short in supply and too high in cost. The Texaco process, providing plentiful, inexpensive hydrogen, may one day augment the refining of gasoline by creating synthetic gasoline or gasoline from upgraded oil.

The Texaco process uses a flame reaction of the hydrocarbon plus oxygen, under pressure, to make synthesis gas. The hydrocarbon and oxygen are both preheated and piped into a reaction chamber. There is no catalyst at all involved.

Inside the reaction chamber, the oxygen and hydrocarbon are set aflame, and a controlled reaction results in partial oxidation. The reaction takes place under a normal pressure of about 400 pounds per square inch, at a temperature above 2,000 degrees. The result is a synthesis gas, high in hydrogen content.

When anything goes wrong, as, for example, should the plant be pumping too much oxygen or too much oil, everything shuts off instantly. As the engineers say, "it fails safe." The problems Texaco engineers solved were numerous. There was, for example, the question of what to build the pressure shell (which contains the reaction chamber) out of: the linings and the outer shell would expand at different rates under the intense heat. The problem was solved by making the shell of steel and the linings from successive layers of insulation materials.

Another problem was to find the right material for the burner for the flame reaction. Wanted was a refractory material that would not need water cooling under the reaction conditions. There was no such thing available. Finally, an alloy burner with a water-cooled tip was ingeniously designed and is operating satisfactorily under the extremely high temperatures.

The generator, where the reaction takes place and synthesis gas is produced, is so responsive to control that it can be brought on stream in 24 hours from a cold start. If the refractory lining is kept hot, it can be shut down and re-started in an hour.

Very first overseas user of the process was The Etablissement Kuhlmann, in France. Since 1956, Kuhlmann has been using fuel oil, instead of the coke it used formerly, to reduce costs of ammonia production.

The fuel oil is obtained during the refining, near the Kuhlmann plant, of Middle East and Sahara crudes. Writing for a French chemical engineering magazine, a Kuhlmann executive said the Texaco process had overcome any early reservations his company may have had about the process. It is, he said, "satisfactory and safe to operate." The advantages it offers, he continued, "are essentially simplicity, efficiency, adaptability, safety, and economy."

Of all indications of the importance of the Texaco process to date, the most heartwarming has been its rapid and widespread acceptance to make fertilizers—and thus to help alleviate the dark, gnawing hunger that has been the lot of most of mankind throughout recorded history. Already one Canadian province, nine American states, and 13 foreign countries are using the process for fertilizers. And because there needs to be virtually no limit to the capacity of a synthesis gas plant using the Texaco method, a single installation can frequently provide all the fertilizer needed by a state or nation.

Based strictly on results to date, it is not an exaggeration to say that the Texaco process already has effected the beginnings of a revolution in world food supply. •

Farming without a harness without a hitch

by George Laycock

As he drives his black sedan down the dusty back roads of his 5,400-acre farm in northern Indiana, William Gehring frequently checks the progress of work being done with his field foreman, by two-way radio. If the sky looks troublesome, he calls for the latest weather forecast out of Chicago.

Farmer Gehring needs two-way radio: his fields spread over several miles, and his labor force numbers in the hundreds, working with 50 tractors and 25 trucks. Gehring manages one of the largest farms in Indiana. He is also one of that state's largest farm users of petroleum products.

"In a normal Summer month," Gehring says, "we use several thousand gallons of gasoline and diesel fuel." In the farm storeroom there is always a minimum of 10 barrels of oil. The brand name on these and all the other petroleum products Bill Gehring's farm uses is Texaco.

The farm's largest crop is corn. Mint ranks second, followed by potatoes (being harvested above) and onions (over 300 acres were planted last year). From planting to harvest, the operation relies heavily on the mechanization petroleum has made possible. It carries more mechanics on the payroll than the number of field hands an average farmer half a century ago would have hired.

CONTINUED

Every crop grown holds some sort of challenge. The search for ways to cut costs goes on constantly. High operating costs reduce margins of profit; rewards go to the farmer who can meet economic challenges with advanced technology.

Onions, which still need hand labor for weeding — and sometimes an investment of as much as $500 an acre to grow —are one of the most worrisome crops. They can also be one of the most profitable. They remain one of the favorites: there is great satisfaction in successfully combating all the threats to the onion crop, bringing in to storage the hundreds of filled 50-pound bags that mean a good harvest.

Work with the onion crop starts in the Fall when the land is plowed. The major reason for Fall plowing instead of Spring plowing is to allow time for fumigating the soil with a sterilizing chemical.

This fumigation is only one of the early steps in the successful growing of an onion crop. In the Spring the soil is loosened to break up the crust on the surface. Next, land-leveling machinery works back and forth over the field ahead of the onion seeders.

The critical seeding job has been speeded up by equipment that puts down seven rows of seeds at a time. This same machinery spreads fertilizer under the seed, and plants a row of oats between each row of onions (the oats create shelter that helps keep the wind from uncovering the tiny onion seeds; they are plowed out after the onions have a good start).

Costs have been neatly trimmed on other phases of onion production, too — especially the harvest. Until three years ago, onions were pulled by hand and their tops were clipped off with sheep shears. Now they are lifted by machine and stored to dry with their tops on. During the Winter months they are taken from storage and sent through a mechanical processing line which removes the tops automatically.

A potato harvest on the Gehring farm clearly shows why the horse couldn't begin to keep pace with the modern farmer's mechanical equipment. When Gehring's crews move in to harvest potatoes the procedure looks startlingly like a military maneuver.

The field foreman's truck rolls into the field first. It's his job to keep the work going smoothly. On the far edge of the field, a diesel-burning weed burner, pulled by a tractor, finishes its job of scorching weeds back to ground level. In minutes the potato-digging machinery lumbers onto the scene. Next comes a truck load of laborers to pick up stray potatoes from the end rows. And in answer to the foreman's radioed call, a bulldozer comes in to fill up a ditch left open during periods of high rains earlier in the Summer. Within a few more minutes men and machinery from other parts of the farm have pulled into the field and set to work getting potatoes from the ground. There isn't a harness in sight — and not a hitch in the work.

Instead of the 125 men who once moved into the fields late in August to begin harvesting the crop by hand, a pair of mechanical diggers now moves across the field digging two rows at a time at a steady speed of about three miles an hour. These diggers lift the potatoes from the ground and move them on conveyors into trucks traveling beside them.

The trucks haul the crop to the potato processing shed. Here they are moved along a mechanical processing line where every hour some 450 bags, of 100 pounds each, are sorted, cleaned, washed, dried, and sacked. During the harvest, a steady line of big tractor-trailer trucks pulls into his packing shed to haul the bagged potatoes to Eastern markets.

This part of the country grows a large part of the nation's mint — for chewing gum, confections, and drugs. From the Gehring farm, mint is shipped in 50-gallon drums; during a good year, an acre of the plant yields 40 to 45

Gigantic boom of specially built crop sprayer stretches for 75 feet across an onion field; one man can cover over 150 acres a day

pounds of oil. Mint is a perennial—it grows every year from its own root stock. But Gehring and other canny farmers rotate the crop. They seldom grow it more than one year in succession in the same fields, because blight tends to build up.

Harvesting mint and collecting oil from it is one of the most interesting farm chores anywhere. The crop is mowed and cured in the sun for a day or two — covering the countryside with the delicious odor of peppermint candy. When the mint hay has cured, it is taken to a distillery where steam volatizes the mint oil — which is later separated from the water the steam has created as it is cooled.

Big, boxy field wagons haul the mint hay to the stills, where it is packed down by crews of farm hands who, their arms linked to give each other support, jump up and down on the hay to compress it so the still's lid can be clamped shut. For the hands, this comes very close to sheer fun. Fun or not, it is one of the few jobs on the Gehring spread which has not been mechanized.

Counting the gasoline-powered engines used during irrigation, the farm maintains a fleet of more than 75 machines to keep the work running smoothly.

Servicing this small army of farm machinery is the job of a full-time driver who goes from one field to the other with a tank truck that carries gasoline, oil, grease, diesel fuel, water, and an air compressor. During rush season a second service truck is also put on the job. In addition to this field service, there are bulk fuel tanks at three widely separated locations on the farm.

Fuel and lubricants come through Texaco's consignee in Rensselaer, the county seat. "Every few weeks," says Consignee K. D. Carter, "I go out to the farm and see the folks there. If they have lubrication problems they want to talk over I'll spend as much time with them as they want me to. But it's a funny thing, they don't have as many lubrication problems as the average farm does. One reason for this is that they keep their machinery in excellent condition. They're good managers."

Literally getting into their work, these farm hands pack down freshly cured mint hay so the still's lid can be clamped shut—one of the big farm's few non-mechanized operations.

Gehring clearly is a good manager. He's farmer enough to enjoy the fragrance of newly turned earth, and businessman enough to appreciate the rumble of powered equipment over his land. Mechanical power means profit to him, and to thousands of other American farmers. •

th this sprayer. It's one of a fleet of machines, serviced by Texaco petroleum products, that keep the Gehring farm running efficiently.

Many factors determine what you pay for petroleum products, but ultimately

Competition Sets The Price

This story begins at the corner service station because that is where most people meet the petroleum industry.

Perhaps once or twice a week, threading through early morning rush hour traffic, a motorist pulls into his neighborhood service station; he stops beside the "gas" pumps, pays for a product he doesn't see, and drives off. Maybe he has noticed a tank truck at the service station, from time to time, but chances are he never thinks about where his gasoline came from or how it was made; probably the only thing he knows about the price of gasoline is that it's pretty much the same everywhere in the neighborhood.

Critics of the petroleum industry point to these identical, or nearly identical, prices within certain areas as signs of collusion. They attack the industry with charges that gasoline prices are non-competitive. Actually, the oil industry is one of the most competitive businesses in the country.

Many car owners do not realize that their neighborhood dealer is usually an independent businessman who sets his own price and operates at his own risk. Your Texaco dealer, for example, probably owns or leases his station (approximately 95 per cent of America's 180,000 service stations are owned or operated by independent businessmen). He buys his Texaco gasoline in bulk, or wholesale, quantities and, generally, from that point on, the oil company has no control over what price will eventually appear on his pumps.

To the wholesale price, the dealer adds an amount he thinks will pay his operating expenses (such items as rent, wages, and advertising) and show a profit. But this amount is determined solely by competition: what your dealer feels that his customers will pay for his products and services. No dealer can charge significantly higher prices for gasoline than his competitors and expect to stay in business for long. Motorists are on wheels; they can look around, compare service station prices, and take their business to the dealer whose price seems right.

There is a third factor affecting the price a dealer sets for the gasoline he sells—taxes. Before the dealer can post a total price he must add local, state, and Federal taxes to the wholesale price and his own markup. Here again, the oil companies have no control. Nor do the dealers; taxes come under the domain of politicians.

In view of this it is interesting that, over the past 10 years, the average service station price (excluding tax) of regular-grade gasoline has risen only six per cent, while taxes rose 37 per cent during the same decade. In 1919, when Oregon imposed the first gasoline tax, motor fuel sold for 25.4 cents a gallon, less taxes. Last year, with taxes averaging nearly nine cents a gallon, the actual price of regular gasoline, less taxes, was 21.4 cents a gallon, *or four cents less than the price 40 years ago.*

To maintain this low-cost record, every company in every phase of the oil business—and roughly 42,000 units comprise the industry—must keep pace with competition and hold its place in the market against the constant pressure of rival firms eager to snap up some of its business. Like the independent dealers, wholesale suppliers and crude producers keep their customers by staying competitive.

With approximately 14,000 companies operating terminals and bulk plants, millions of gallons of gasoline move daily from refineries to the wholesale markets. More than 200 oil companies, owning about 350 refineries that manufacture gasoline, sell to tens of thousands of jobbers and bulk customers, as well as dealers. The daily interplay between skilled buyers and sellers keeps the wholesale prices of gasolines constantly changing in response to competitive influences within the market. This price structure fluidity is one of the best examples of "living competition."

The petroleum industry spends over $300 million annually on research alone to provide consumers with improved products at reasonable prices. Gasoline may look and smell the same now as it did years ago, but two gallons of today's motor fuel provide as much energy as more than three gallons did in 1926. It seems obvious that if there were no competition in the industry, such vast investments in research would not be made.

But where is the competition, critics ask, when all the dealers charge the same price? To begin with, all dealers do *not* charge the same price; within any sizable community there are usually significant variations in gasoline prices. Identical, or nearly identical, prices are found where service stations are engaged in direct competition with one another and, in fact, such prices are a strong reflection of intense competition, rather than the opposite. An important point is that "competition" does not necessarily mean that prices must be different.

At any busy intersection, chances are a car owner finds two or three—perhaps even four—dealers vying for his trade with a wide choice of competing brands. If one dealer raises his price at a time when the over-all market is not receptive to a price rise, it won't be long before he finds his customers trading across the street; conversely, if one dealer lowers his price, the other three will soon lower theirs or risk operating at a loss. The tendency of direct competition to express itself in similar prices was observed by Simon N. Whitney, Chief Economist and Director of the Bureau of Economics of the Federal Trade Commission, in his book, *Antitrust Policies*. After exhaustive surveys of five different areas where dealers operated in close competition, Mr. Whitney concluded that "the more keenly consumers are interested in price, the more likely are prices to be identical."

The aggressively competitive atmosphere that characterizes the gasoline business is evident not only among independent dealers, but finds expression throughout the industry. Competition's effect on prices reaches back through the wholesale suppliers to the refiners and crude producers, and helps explain why there have only been two general crude oil price rises over the past 10 years—one in 1953 and another in 1957. The point that competition—not individual companies—determines prices, even on crude oil, was brought out by Texaco President James W. Foley during the 1957 Joint Senate Hearings of the Senate Subcommittees on Antitrust and Monopoly and on Public Lands.

"Had we failed . . . to increase the price of crude," Mr. Foley said, "we would soon have found ourselves without sufficient crude to run our refineries. If we continue to pay more for the crude and don't raise the price of the products, we will be popular, perhaps, for a short period of time, but our popularity would soon be eliminated by the elimination of us as marketers of petroleum products."

As an interesting footnote, competitive pressures pushed so hard against the 1957 increase that it receded gradually until, in 1958, the average price for crude was *lower* than in 1957.

Oil industry critics also argue that, if identical or similar prices reflect strong competition, and the petroleum industry *is* so competitive, then why do prices vary from area to area? In the first place, prices vary as local conditions vary, and local conditions, including the cost of living and the cost of doing business, are not the same everywhere.

A dealer located in an out-of-the-way place generally must seek a larger markup than dealers on a heavily traveled highway. He probably couldn't pay his expenses, much less make a living, if he had to get along on the same margin as dealers who enjoy a year 'round, big volume business.

The lack of understanding on the part of consumers is a powerful weapon for opponents of the oil industry, who say that wholesalers and refiners discriminate against the small-volume dealers and fix prices in favor of dealers located in heavily populated areas. These critics pull out a map and ask why gasoline refined in Texas should sell for less in the Eastern industrial states than in the closer Midwest farmlands. They say it is because Eastern suppliers agree to fix prices at a lower level, counting on the increased volume possible through the East's higher concentration of dealers to set cash registers jingling. They apparently do not realize that one of the major reasons is because the East's gasoline is to a great extent transported by ocean tanker, which is an inexpensive method of transporting petroleum in large quantities.

During recent years, many state investigations and official studies of pricing practices in the oil business—such as those conducted in Maine, Vermont, and Connecticut — have shown, time and time again, that price fixing does not exist. These reports authoritatively support the industry's argument that consumers who live in higher price areas are not being overcharged, but are paying the normal price under normal market and competitive conditions *for that section*.

One of the best qualified opinions to go on record supporting the oil industry was a report made by Michigan's Attorney General to the Governor in 1956: "Particular care was taken . . . to ascertain if there exists . . . any evidence from which a conspiracy, agreement, or collusion could be determined as a fact or assumed by inference. Any such evidence was lacking. When the pricing practices of the major oil companies are known, it is readily understandable why their wholesale prices in a given area are identical, or substantially so, and why changes in the wholesale price occur at about the same time."

What Michigan's Attorney General found in his study is true right across the nation. The oil business *is* competitive—more competitive than most. Its products are among the basic commodities that serve the economy of our nation; they are vital to our national defense. Competition has developed the industry's ability to supply abundant energy wherever it is required, at a reasonable price. •

In Alaska, during a helicopter hop from Cordova to Katalla, Texaco geologists stop to examine a crevass on the gleaming face of Miles Glacier.

MOVING NORTH FOR OIL

According to Eskimo legend, a little boy and a little girl wouldn't obey their father when he called them indoors each evening. One night, the father became so angry he said they must play outdoors forever. They wandered across the rough tundra, with only a seal oil lamp to guide them, and as the girl stumbled she spilled the precious oil—some within the Arctic Circle, some near the Gulf of Alaska, some in the Yukon, and some by the Bering Strait.

That's how Eskimos, for many generations, have explained the oil seepages on the surface of their land. Today, oilmen scouting the 49th State's mountains and plateaus turn to science for the answer.

Alaska contains a number of large basins which appear favorable for the accumulation of oil and gas. The Department of The Interior estimates that more than 100 million Alaskan acres have geologically promising characteristics.

The geologists shown here and on the next two pages are members of Texaco teams which have been looking for oil, from Kenai Peninsula to the Arctic Plain, since 1954. In that year, oil company leases covered barely half a million acres. The news in mid-1957 of a successful strike on Kenai Peninsula spurred an industry-wide interest in a search for oil that saw 75 million acres staked out by the end of 1958. Now, virtually every American company has Alaskan holdings and scores of independent prospectors are busy filing land claims. Texaco, through leases and options, holds about 250,000 acres.

During the next five years, the oil industry will probably spend over $300 million for exploration and drilling. Eleven companies, including Texaco, have completed a joint seismic survey over the submerged and tidal lands of Cook Inlet, and the survey's results are now under careful evaluation.

If substantial reserves *are* found in Alaska, they will not have been come by easily. Only two per cent of her sprawling 586,400 square miles have been surveyed. Twice the size of Texas, the new state has fewer paved roads than Brooklyn. Moving supplies, crews, and equipment across such raw, undeveloped country is a major problem in logistics and the price of admission is high; a well that costs $150,000 to drill in Texas may soar to $1.5 million in Alaska.

Although Texaco has not yet drilled for Alaska's oil—that's the only way to find out if there *is* oil—there is an expanding market for petroleum products, and the Company is doing something about it. Already, strategically located service stations are being established to meet the area's growing needs.

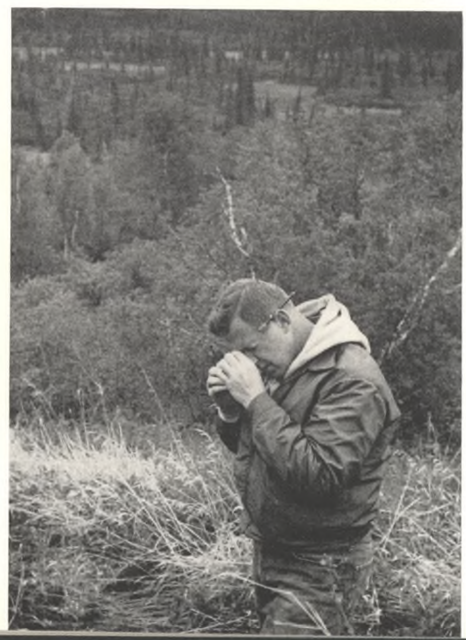
Texaco is also constructing three storage facilities to handle its Alaskan markets—a water front terminal at Seward and two bulk storage plants, one in Anchorage, Alaska's largest city and gateway to the vast interior, and the other in Fairbanks. Alaska has no refining facilities or pipe lines, so the Company must ship aviation and automobile gasoline, diesel and burner oils, and kerosine by barge from its Anacortes, Washington, refinery to Seward. From there, Texaco products travel by rail inland.

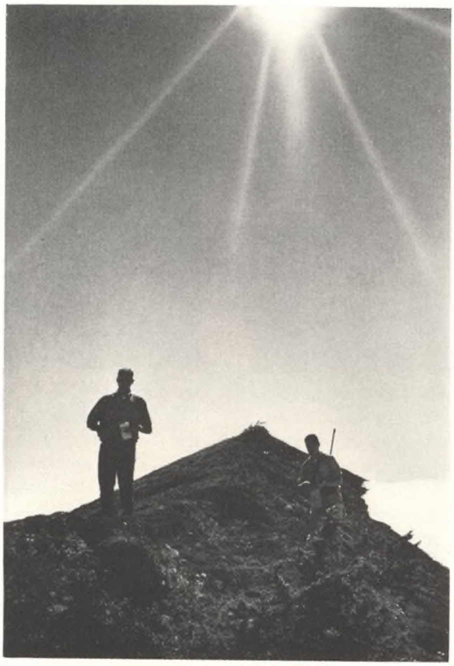
If oilmen find the petroleum reserves they hope to, Alaska stands to benefit tremendously. Easily available petrolem would give it the energy source it needs to accomplish the industrial development it wants. Still unanswered, though: how much oil is there? The question may be answered soon, and could establish our 49th State as one of the world's great petroleum producing areas. *CONTINUED*

Snow-tipped Chugach Mountains rise behind port of Cordova, headquarters for the team of geologists operating in Katalla area.

Team members stroll along Cordova's streets after a Summer evening's supper; at nine o'clock, sun is still shining.

Geologist studies rock chips in the tundra land near Bethel, on the Kuskokwim River, to evaluate the area's oil prospects.





High atop craggy peaks near Katalla, teams work swiftly to utilize abnormally long period of sunny weather—11 days.

IN THE NEW STATE,

NEW RESERVES?

ar hunts in Marshall, home for one geological team, are big events; here, an kimo girl overcomes her shyness, and stands beside a newly stretched bearskin.

Geologist sits on a mountain's dizzying brim to examine a rock sample; the speck in the sky is his helicopter "taxi."

IN NEW POSTS

Effective August 1, responsibilities for the direction of Texaco's world-wide sales and for the administration of the Company's Foreign Operations Department (Western Hemisphere and West Africa) were realigned. Harris T. Dodge, formerly Vice President in charge of Foreign Operations (Western Hemisphere and West Africa), was elected Senior Vice President in charge of the Company's world-wide sales operations. He succeeds T. C. Twyman, who has been named Senior Vice President in charge of special assignments. Landon B. Derby, previously General Manager of Foreign Operations (Western Hemisphere and West Africa), was elected Vice President to succeed Mr. Dodge.

HARRIS T. DODGE

LANDON B. DERBY

Mr. Dodge, who joined Texaco in 1920, has held numerous domestic and foreign posts in the Refining and Sales Departments during his 39-year career with the Company. He has been Manager of Texaco sales in Brussels, The Hague, and Manila.

In 1944, he was named Manager of Texaco's Foreign Sales Department in New York, later became General Manager of Foreign Operations (Western Hemisphere and West Africa). He was elected Vice President in charge of the Department in 1956.

Mr. Derby's association with Texaco began in 1927. After serving at the Company's refinery in Port Arthur, Texas, he held overseas posts in Haiti, Puerto Rico, Mexico, Uruguay, and Argentina. He was transferred to New York in 1951 as Assistant General Manager of the Foreign Sales Division. In 1956, he became Assistant General Manager of Foreign Operations and was named General Manager the following year.

DISMISSAL OF GOVERNMENT SUIT AGAINST CALTEX UPHELD

The United States Court of Appeals has unanimously upheld a lower court decision dismissing a Government suit to recover $66,021,257 in alleged overcharges in the sale of oil by Caltex to foreign countries under the Marshall Plan. Caltex consists of a number of companies jointly owned by Texaco Inc. and Standard Oil Company of California.

The Government made Texaco a party to the suit on the theory that the Caltex group and its stockholding companies should be treated as one, a contention which the District Court rejected in 1957.

The Court's decision ends nearly seven years of legal debate and an unsuccessful Government appeal that cost the oil companies hundreds of hours of executive time and hundreds of thousands of dollars in defense fees.

The Caltex companies sued were California Texas Oil Company, Limited, The Bahrain Petroleum Company Limited, Caltex Oceanic Limited, and Mid-East Crude Sales Company Limited.

The Government originally charged Caltex with overcharging approximately $16 million for Middle East crude oil, bought under the foreign aid program over a two-year period from September 1, 1950, to September 1, 1952. The oil purchases were financed by the Mutual Security Agency, formerly the Economic Cooperation Administration. At that time, the Government claimed, Texaco was selling Arabian crude oil in Western Hemisphere markets at prices that netted back in the Middle East, after deductions of assumed freight rates, amounts below the prices charged European customers.

In affirming the lower court's decision, Federal Judge Thomas F. Murphy said the prices charged were fair and competitive. ECA, by continuing to finance crude oil sales at the same price for two years, endorsed the propriety of Caltex prices. He also indicated he found no evidence of fraud or deceit in the business dealings between ECA and the oil companies.

A 20-page opinion, written by the Appeals Court Judge, stated, in part:

"After a careful review of the record, the conduct of the parties themselves, their own approaches to the problems then facing them, and their own contemporaneous interpretations of the regulations, the conclusion is clear, as succinctly summarized by the lower court, that the defendants' proof showed beyond contradiction that the prices . . . were in fact the lowest competitive market prices."

HUNTLEY-BRINKLEY ON TV FOR TEXACO

Texaco's sponsorship, beginning June 29, of NBC's award-winning "Huntley-Brinkley Report," a quarter-hour television news program, is the latest step in the Company's policy to sponsor public service presentations and entertainment of the highest quality.

The program, renamed *The Texaco Huntley-Brinkley Report,* is carried Monday through Friday by NBC television stations across the country, bringing viewers the day's news.

Last Spring, the show won an Emmy Award from the National Academy of Television Arts and Sciences as the best news-reporting series. The program's format features Chet Huntley from New York and David Brinkley from Washington, reporting news of national and international events gathered by NBC's world-wide news staff.

Huntley, a veteran of 25 years as a broadcast journalist, has won three Peabody Awards. Brinkley has been with NBC News for more than 15 years, and is an authority on Capitol Hill and developments in Washington.

NEW BOOK TRACES OIL'S FIRST CENTURY

Tracing the history and development of the oil industry in America from its beginning in 1859 to the end of the Nineteenth Century, *The Age of Illumination*—first of a two-volume history of the American petroleum industry—was published by Northwestern University Press during the last week in August as part of the industry's Centennial celebrations. The second volume, as yet unpublished, will record the industry's growth over the past 59 years.

The first volume is available to employes and stockholders, as members of the oil industry, for $3.75.

PARAGON PURCHASE OPENS NEW MARKETS

This Summer, Texaco acquired Paragon Oil Company, Inc., and affiliated companies. The Paragon group is a major distributor of home and industrial fuel oils and other petroleum products in the Eastern United States, and it will greatly strengthen Texaco's marketing position along the East Coast.

The acquisition allows Texaco, for the first time, to engage directly in the fuel oil business in the large Eastern Seaboard market. Paragon is primarily engaged in the marketing and distribution of home and industrial fuels and heating oils in an area stretching from Maine to Maryland. In addition, the Paragon group manufactures and sells oil burner units and associated equipment.

Paragon's physical assets include 11 ocean and inland terminals; six tankers owned, four under charter.

This Summer, as part of a four-day Texaco Directors' inspection trip, Company Directors and executives visited Texaco's New Orleans headquarters building—where they met with members of the Domestic Producing, Sales, Legal, and Comptroller's Departments—and then surveyed producing operations, sales facilities, and pipe line installations in the Louisiana coastal area. Above, the group is pictured during a stopover at the Producing Department's Caillou Island Camp. From left: W. E. Avery, Secretary; L. J. Norris, C. L. McCune, W. H. Mitchell, J. S. Leach, Dwight P. Robinson, Jr., Henry U. Harris, Ogden Phipps, Directors; H. X. Bay, Producing Department Division Manager; Augustus C. Long, Board Chairman; James W. Foley, President; R. C. Shields, C. B. Barrett, Directors; F. C. Brewer, Drilling and Production Foreman; G. A. Gammill, Assistant Division Manager; M. J. Epley, Jr., Vice President and Assistant to the Chairman; L. W. Calahan, Assistant Division Manager; E. W. Quinn, Assistant Secretary; Kerryn King, Vice President; G. D. Sherman, District Superintendent. Directors not present for the photo: Oscar John Dorwin, W. S. Gray, G. W. Humphrey, and Langbourne M. Williams. In December the Directors will inspect the operations of Texaco Trinidad, Inc.

SUPERIOR MERGER WITH TEXACO IS BARRED

On June 18, Augustus C. Long, Chairman of Texaco Inc., and William M. Keck, Chairman of The Superior Oil Company, issued a joint public announcement that they had reached "an understanding in principle looking toward combining the organization, operations, and assets of Superior with those of Texaco." The terms of the understanding were that Superior would receive 24 shares of Texaco stock for each share of Superior stock outstanding; that Texaco would assume Superior's liabilities; that Superior would be dissolved.

The planned merger — which involved the transfer of stock valued at more than $765 million — held substantial potential benefits for both companies. Comments in the public and trade press were uniform in terming the proposed merger "a natural."

Superior, solely a producing organization, has extensive reserves and production of both crude oil and natural gas in the United States, Canada, and Venezuela, but lacks refining and marketing facilities. In Venezuela, Superior has the capability to produce 70,000 barrels a day of crude production from existing wells on its Lake Maracaibo concession. Because of mandatory import controls — based on domestic refinery runs — Superior is unable to bring this production into the United States, and for the first six months of 1959 was able to dispose of only 36,000 barrels a day.

For Texaco, acquisition of Superior's assets would have enabled the Company to supply from owned sources in the Western Hemisphere more of its refinery requirements and better meet the continually increasing demand for its products. The merger also would have further balanced Texaco's interests as between the Western Hemisphere and the Eastern Hemisphere.

A thorough study of the proposed merger was made by the Company's Legal Department and other distinguished antitrust and trial counsel were consulted. All were of the opinion that it would not be in conflict with the Federal antitrust laws. They noted that Texaco accounts for only seven per cent of domestic crude oil production while Superior accounts for about one-half of one per cent.

Based on these opinions, the two companies proceeded to work on the preparation of a formal agreement. At this time, also, Texaco voluntarily agreed to keep the Antitrust Division of the Department of Justice informed of its plans and to furnish all pertinent data and other information freely and fully. All such material was subsequently provided.

The merger was to be voted on by Superior's stockholders at a meeting set for September 25. Two days prior to that time, however, the Department of Justice informed Texaco and Superior that it felt the proposed merger would unreasonably restrain competition in the oil industry, and that the Government would institute injunction proceedings if the attempt were made to complete it.

Every consideration was given to going forward with the merger and opposing in the courts the efforts of the Department of Justice to obtain an injunction. Our legal counsel felt we should succeed in persuading the court that the merger was legal, but were of the opinion that we should reasonably expect a delay of at least two or three years before a final decision would be rendered. Similar delays are being experienced by other companies which are presently litigating such matters.

After careful review, it was the unanimous decision of the Board of Directors that we should terminate our arrangement with Superior.

An important factor influencing this decision was our need either to have Superior's production and reserves now or to be free to work out promptly a forward planning program which would satisfy our requirements in other ways. It was also recognized that during any such long period of uncertainty we could not reasonably expect Superior's employes to decline other opportunities and this would have been a serious loss to us. Superior was in much the same position.

Texaco's record speaks for itself and clearly shows that the Company is not reluctant to submit its transactions to the courts. Under other circumstances it might have welcomed the opportunity to validate the Superior merger in the courts, but the severe disruptive effects of the necessary long delays on both Texaco and Superior made such a choice impracticable.

There is no denying the fact that the blocking of the merger came as a severe disappointment to both Texaco and Superior. The agreement to terminate, however, was a mutual and a cordial one.

It will now be necessary for Texaco to develop in other ways the substantial additional reserves and production, and large prospective acreage in the Western Hemisphere, which would have been acquired with Superior. The job will be costly and take time, but it is one that Texaco confidently expects it will achieve. •

In Marshall, Alaska, a Texaco geologist—one of several now evaluating oil prospects on the Company's land holdings in the 49th State—stops to chat with an Eskimo trapper, who converts discarded oil drums into shelters for his Huskies.

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